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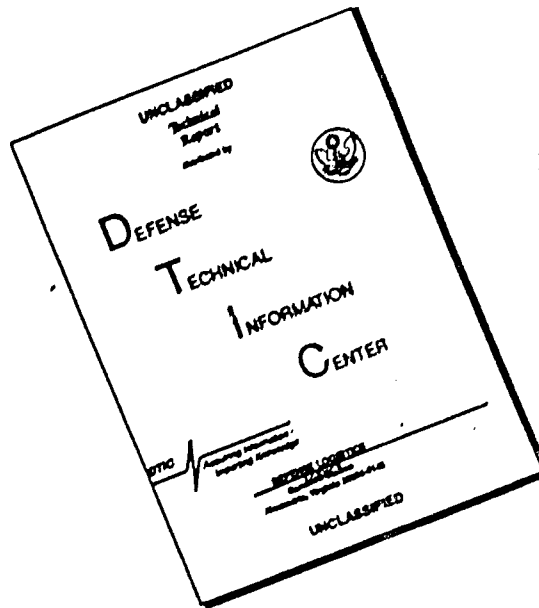
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DEPARTMENT OF THE ARMY  
OFFICE OF THE ADJUTANT GENERAL  
WASHINGTON, D.C. 20310



IN REPLY REFER TO

AGAM-P(M) (16 Aug 67) FOR OT RD 670069

23 August 1967

SUBJECT: Operational Report - Lessons Learned, Headquarters, 27th Engineer Battalion (Combat)

TO: SEE DISTRIBUTION

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1. Forwarded as inclosure is Operational Report - Lessons Learned, Headquarters, 27th Engineer Battalion (Combat) for quarterly period ending 31 January 1967. Information contained in this report should be reviewed and evaluated by CDC in accordance with paragraph 6f of AR 1-19 and by CONARC in accordance with paragraph 6c and d of AR 1-19. Evaluations and corrective actions should be reported to ACSFOR OT within 90 days of receipt of covering letter.

2. Information contained in this report is provided to the Commandants of the Service Schools to insure appropriate benefits in the future from lessons learned during current operations, and may be adapted for use in developing training material.

BY ORDER OF THE SECRETARY OF THE ARMY:

*Kenneth G. Wickham*

KENNETH G. WICKHAM  
Major General, USA  
The Adjutant General

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as

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HEADQUARTERS  
27TH ENGINEER BATTALION (COMBAT)  
APO 96257

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For Quarterly Period Ending 31 January 1967

THRU: Commanding Officer  
79th Engineer Group  
APO US Forces 96491

THRU: Commanding General  
US Army Engineer Command, Vietnam (P)  
ATTN: AVC-DH  
APO 96307

THRU: Commander in Chief  
United States Army, Pacific  
ATTN: GPOP-OT  
APO 96558

TO: Assistant Chief of Staff for Force Development  
Department of the Army (ACSFOR DA),  
Washington, D.C. 20310

SECTION 1. Significant Organization or Unit Activities

1. Cantorment Construction Activities

a. General

(1) Organization

Headquarters and Headquarters Company, Long Giao  
A Company, Long Giao  
B Company, Gia Ray  
C Company, Long Giao  
D Company, Detached to 3rd Bde, 4th Inf Div  
156th Engr Detachment (WD), Attached from 79th Engr Gp

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(2) Mission: Engineer cantonment construction in the Long Giao-Xuan Loc area.

b. Command. During this report period the unit continued to be attached to the 79th Engineer Group for operational control and was reassigned from 18th Engineer Brigade to United States Army Engineer Command, Vietnam (P) on 27 Nov 1966.

c. Personnel, Administration, Morale, and Discipline.

(1) Personnel: The battalion strength increased from 737 to 804 during the report period. Most gains were received thru replacement channels, though a few inputs were the result of requisitions placed at Fort Campbell in May 1966. Personnel received have been in all grades, E9 through E2, the bulk having MOS's short in the battalion. The battalion has suffered losses as follows:

- (a) KIA - 3 EM.
- (b) Med Evac out of country - 5 FM.
- (c) ETS - 2 Off, 7 FM.
- (d) Transfer within RVN - 6 Off, 3 FM.

(2) Administration: Generally, no administration problems have been encountered which could not be overcome locally. The one area which remains unacceptable is communications with 79th Engineer Group. A courier service furnished by IIFV is utilized for daily forwarding of reports and distribution. This service must route distribution through two message centers on each end. The result is lost distribution, delayed delivery, and missed suspense dates. The system will and must work as the use of overland couriers is impractical because of distance and security requirements for convoys. Continued emphasis on proper message center operation should give a maximum of two days delivery time from any office in this headquarters to any office at 79th Engineer Group.

Publications are being received in a timely manner, however, insufficient copies of USAECV(P) and USAFV Regulations prohibits distribution to company level. Requisitions have been submitted to bring publications levels up to AGI standards.

(3) Morale: Morale within the battalion has been extremely high, due to the R&R program, availability of athletic equipment, regular showing of free 16mm movies, hot showers, electricity in tents, and the opening of an FM club. The latter enterprise has been successful largely through the untiring efforts of the club custodian and manager who have been able to keep enough beer and pop on hand in spite of transportation and availability difficulties.

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Chapel services are above par, with the battalion Chaplin conducting 2 protestant services on Sunday and bible study and discussion sessions 2 nights a week. In addition, services are held for Catholics in the unit chapel every Sunday. Both Protestant and Catholic Chaplins visit B Company on a weekly basis, dependent upon transportation availability.

(4) Discipline: Disciplinary problems have been relatively few during the report period. Statistics show 26 Article 15's, 1 Summary Court, 1 Special Court, and 1 General Court. The high state of discipline is attributed to the remoteness of the base camp, and the fact that the men put in the required 75 hours per week on the job.

A recent significant rise in a previously low venereal disease is presently the object of an intense command emphasis program. Since sources of VD are Xuan Loc, Long Binh, and in-and-out-of-country R&R centers, a vigorous education program oriented toward prophylaxis appears to be the best "preventive medicine".

d. - Intelligence and Counterintelligence. Nearly all intelligence concerning enemy activity has been obtained by direct liaison with the S-2 of the 11th Armored Cavalry Regiment, the major unit located here at Long Giao. Intelligence summaries coming through engineer channels of command take 6 to 10 days to arrive and have little value for the maintenance of the daily cantonment, worksite and convoy security.

e. Plans, Operations and Training.

(1) The beginning of this report period coincides with the Operational Readiness date of the Battalion (minus C Company) in Vietnam. Equipment for Hq, A, B, & D Company arrived in country on 23-26 Oct 1966. With receipt of equipment, this headquarters moved in increments from its Long Binh staging area to the site of its major construction effort, a 5736 man cantonment for the 11th Armored Cavalry Regiment at Long Giao.

(2) During the staging phase, preliminary Base Development plans were designed by this headquarters as were the unit area layouts and standard drawings for tropicalized construction of latrines, showers, and messhalls. Throughout the report period, more detailed study, customer coordination and construction experience in Vietnam have produced a very definitive Base Development Plan, large scale layouts of Unit Areas, a deliberate drainage plan, and an excellent file of standard drawings for tropicalized construction.

(3) Upon becoming operational, "A" Company moved into temporary bivouac at Long Giao, via YS 441975 on 26 Oct 1966 preparatory to initiating their assigned mission of horizontal construction. Since that date, this unit has been carrying out that mission to include interior roadnet, clearing fields of fire and unit areas, drainage system, hardstands, and placing concrete floor slabs. At the same time, elements of the company began the horizontal construction effort for a 60 Bed Surgical Hospital and a forward area liaison airfield also at



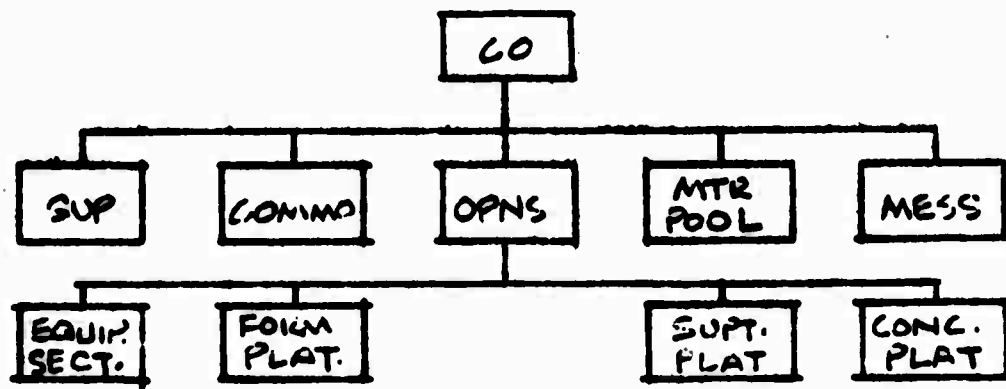
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Long Giao. As of the end of this reporting period, A Company continues with its primary mission of horizontal construction for the 5736 man cantonment, 60 Bed Surgical Hospital and forward area liaison airfield.

(4) After the mission of horizontal construction was assigned to A Company the following reorganization was effected:



(5) Upon becoming operational, B Company moved on 4 Oct. 1966 from Long Binh to Di-An to assist 168th Engineer Battalion (Combat) in cantonment construction for the 2nd Bde of the 1st Inf Div. From 6 Oct 1966 to 29 Oct 1966, this unit poured 18 20'x48' concrete pads and erected 10 20'x48' tropicalized wood buildings. With this project completed, B Company moved into temporary bivouac, vic Gia Ray on 1 Nov 66, to open a rock quarry, prepare a crusher site and construct a 200 man cantonment. Initial clearing and earth moving continued through 25 Nov 1966 when this unit then moved into the permanent cantonment site. From 27 Nov 1966 to 23 Jan 1967, this unit was engaged in constructing the crusher site, developing the quarry in attempts to establish a solid face, improving the perimeter fortifications and construction of the 200 man cantonment. The primary and secondary units of the crusher, without conveyors, were delivered and set up from 23-30 Jan 1967. By the close of this report period the crushing unit was operational, showers and latrines complete and 50% of the messhall constructed.

(6) One platoon of B Company from 7-31 Jan 1967 was engaged in executing the construction of 3 drainage plans for cantonments in Xuan Loc and the construction of four heavy timber artillery firing pads.

(7) C Company arrived in country on 13-14 Aug 1966 and has been fully operational from 21 Sept 1966. During the period 21 Sept to 8 Nov 1966 this unit accomplished the mission of constructing a 105 man cantonment in Xuan Loc for the newly arrived 54 Artillery Group, and a 40 man cantonment on Hill 837 for a radio relay unit of the 53rd Signal Battalion. Both projects were completed (except for the water distribution system on Hill 837 pending arrival of materials) when C Company moved to Long Giao on 9 Nov 1966 to assume the responsibility of vertical construction for the 5736 man cantonment.



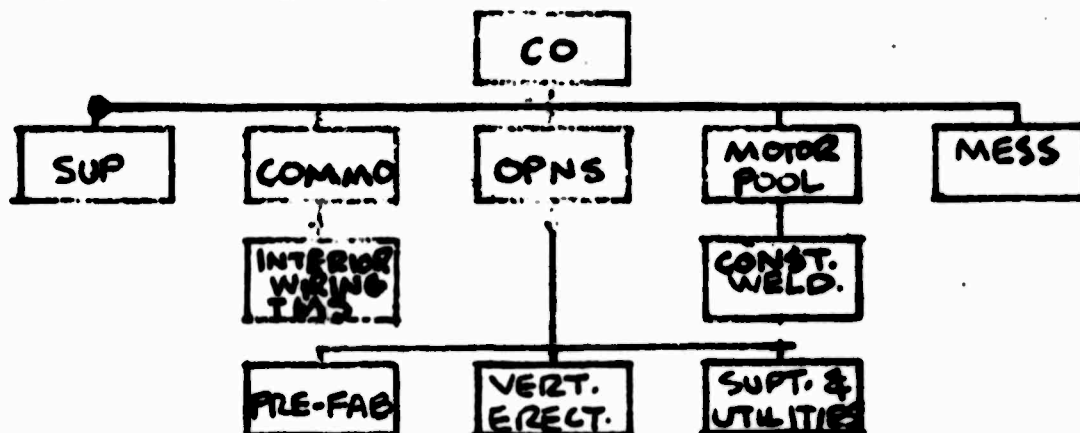
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Since that date this unit has been carrying out that mission by prefabricating 90,350 sq ft of building and erecting 30,500 sq ft of building. At the same time, elements of the company developed the fortifications on their sector of the Base Camp perimeter and began the vertical construction on the 60 Bed Surgical Hospital also at Long Giao.

(8) After the mission of vertical construction was assigned to C Company, the following reorganization was effected:



(9) On 14 Jan 1967 this headquarters received the mission to upgrade Xuan Loc Airfield to C-130 capability. By the close of this report period preliminary surveys had been taken of existing conditions and preliminary profiles, mass diagrams and work estimates completed.

(10) On 21 Nov 1966 this headquarters had attached to it the 156th Engr Detachment (Well Drilling). Since that date this unit has been operational in the Xuan Loc area. From 17 Nov 66 to 18 Jan 1967 this unit drilled well #1 to a depth of 104 feet. It test produced 64 gallons per minute with a 10 foot drawdown. From 19 Jan 1967 to the end of this report period this unit drilled well #2 to a depth of 93 feet. It also test produced 64 gallons per minute with a 10 foot drawdown. At the close of this report period installation of screens in wells #1 and #2 was in process.

#### f. Logistics and Maintenance;

(1) Construction Materials: Availability of materials varies drastically. The availability is determined solely by what materials arrive in country. There are times when you may receive more of an item than you can use at the moment. Also, there are times when you receive none even though you have an urgent requirement for the item. This is especially true of seasonal type items, i.e., Pencprime and other material for dust control.

The only solution to the problem, which is usually almost impossible to attain, is to forecast your requirements as far in advance as possible. This means you will need a sizeable storage area in which to stockpile materials

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against future requirements.

(2) Location of Supply Points: Unless you are assigned to an area which had existed for quite some time, you will probably find yourself a good distance from supply points. At the present time we are located 30 miles from our source of most materials. This distance causes a delay both in placing demand and receiving supplies. It also causes a great deal of confusion in that direct contact sometimes cannot be made between us and the supplier.

We have put an NCO in the area near the supply points on TDY. All business dealing with supplies go through him. He constantly keeps in touch with the various areas, reporting back via telephone what is available for pick-up.

(3) Transportation: With the construction and combat support missions of the unit, organic transportation for hauling supplies and construction materials is usually not available.

We are presently utilizing two sources of transportation. The first is transportation organic to our group headquarters. The group has two bridge companies which it is using to haul materials to the units within the group. The second source of trucks are the transportation units located in the area of the supply points. The only thing wrong with this source is that they are not concerned with the quality of the material that they pick-up. We have received several loads of materials that were either unuseable due to laying around in the weather, or due to improper handling. If we had picked up the material ourselves, we would have refused this type. Since they are only concerned with moving material, they haul whatever is loaded onto the trucks.

(4) Dust Control: Dust continues to be a major factor affecting the operation of equipment during the dry season. Drivers of dump trucks in many cases find it hard to see while traveling on haul roads. Both diesel and penepime have been employed to reduce this safety hazard. Drivers have been instructed to slow their vehicles down in order to avoid accidents and lower the dust level.

(5) Lubrication Intervals: All units have been informed that the lubrication intervals stated in the LO's and TM's are just a guide for normal operations. All lubrication intervals have been cut in half for ordnance and engineer equipment by this battalion. Engineer equipment requiring daily lubrication is now being lubricated at prescribed hourly intervals.

(6) Wire Rope: Wire rope of 1/2" and 5/8" diameter has not been readily available nor have appropriate cable clamps. An alternate source of 1/2" wire rope is from the winches mounted on various pieces of ordnance equipment.

(7) Oxygen and Acetylene: Any unit preparing to come to VN should bring as many oxygen and acetylene bottles as they can. Direct exchange

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is made in Vietnam on a one for one basis.

(8) Red Ball: The "Red Ball" system of obtaining critical repair parts has been very effective. However 24 to 48 hour delivery has not been the case. Red Ball deliveries have been averaging 25 to 35 days. The important consideration is however, that parts that are Red Ball do eventually come in. This system should not be overloaded and should be utilized when appropriate.

g. Civil Actions

(1) Large quantities of clothing and school supplies were distributed to the children of Xuan Loc during the Christmas Season. The Ladies Auxiliary of the VFW has been responsible for many of the school supplies arriving at this unit for distribution.

2. Operational Support Activities

a. General.

(1) Organization of Responsibilities

A Company Route 321, Route 20 and Route 1 from Long Binh to Xuan Loc.

B Company Route 333, 334, 335, 336, and Route 1 from junction of Route 336 to Gia Ray.

C Company Route 2 South to TAOR boundary and Route 320 to Bear Cat.

(2) Mission. Operational support to the 11th Armored Cavalry Regiment within their tactical area of responsibilities (TAOR).

b. Command. During operational support missions the supporting element from this unit is within the command structure of II FFV.

c. Personnel, Administration, Morale, Discipline, None.

d. Intelligence and Counterintelligence.

(1) Prior to each operational support mission the S-2 Section of this headquarters has provided valuable current intelligence through air and ground reconnaissance.

(2) Deliberate ground reconnaissance of Route 1 from Long Binh to Xuan Loc has been accomplished to include bridge and route classification, typical road cross sections and photographs. A detailed report was submitted for planning of future upgrading.

(3) Preliminary air observation and aerial photography was performed of Route 1 to Gia Ray, Route 333, 334, and 335 to Tanh Linh prior to

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operational support activities. Deliberate ground reconnaissance during later operations provided up dated bridge and route classifications. Deliberate ground reconnaissance of 11 miles of Route 336 South of Tanh Linh produced valuable information on 9 bridges and several roadblocks.

(4) Deliberate air and limited ground reconnaissance has been conducted on 119 KM of Route 20 from Route 1 to Bao Loc. Valuable information has been gathered along this section from low flying UH-1B helicopters and the many photographs taken. This intelligence was compiled and a detailed report submitted.

(5) Deliberate ground reconnaissance of all airfields in TAOR has been performed to secure intelligence necessary for upgrading to G-150 capability and parking apron construction. Marking of all airfields in TAOR has also been accomplished this report period.

(6) Engineer Intelligence is greatly needed in this area and every effort is being made to move reconnaissance teams through out the TAOR. The chief restriction of course is security as every move and stop need be coordinated with the 11th Armored Cavalry. Excellent cooperation has been given along these lines, but due to the lack of operations in many areas, and the distances involved, only a small percentage of the needed information can be recorded monthly.

(7) It might be well noted that ; given the requirement to make a reconnaissance of long sections of unsafe, or impassable roads, excellent use has been made of pictures taken from low flying helicopters. A mission of this nature requires the support of additional gun ships making the flights difficult to schedule. This Battalion is seriously handicapped in its reconnaissance mission by the shortage of all cameras and a lack of darkroom equipment authorized, KS-4 cameras are said to be in country but have not been issued. KS-15 cameras are not in country; yet a certificate of non-availability cannot be obtained to allow purchases of these items with the established impress fund. Personal cameras have been used extensively but the shortage of the authorized KS-12 enlarger creates the severe problem of processing, which up until now has been carried out by one individual's personally owned equipment located at 79th Engineer Group (Const). This section is at present attempting purchase of needed equipment with personal funds.

#### e. Plans, Operation and Training.

(1) Employment as infantry in defense of Base Camp is the responsibility of this headquarters when the 11th Armored Cavalry Regiment is committed as a unit. The necessary operations order has been published, the basic load of ammunitions increased, underground land line communication installed, coordination made with subordinate units and implementation of the operation order practiced.

(2) During this report period, 2 elements from "A" company provided operational support to the 11th Armored Cavalry Regiment on 17-23 Jan 67. Second and third Platoons of Alpha Company and attached equipment replaced two bridges, with culverts and laterite fill, on Route 321. Second Platoon constructed the bridge over the Suoi Cam waterway and Third Platoon constructed

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the bridge over the Suoi Gia Dach waterway. A total of 1215 manhours and 184 equipment hours were expended.

(3) From 8 Dec 66 to 29 Dec 66, two platoons of B Company were involved in operational support of the 1st Sqdrn, 11th Armored Cavalry Regiment, on Operation DAY TAM 81. During this period the unit upgraded the Vo Dat airfield to C-130 capability and the Tan Linh airfield to C-123 Capability. The unit upgraded routes 333, 334, and 335 by installing two major bypasses, replacing numerous bridges with culvert and earth fill, and widening existing bridges with native logs. A total of 10,300 manhours and 3364 equipment hours were expended.

(4) From 2-8 Nov 1966 C Company (-) was involved in operational support of the 11th Armored Cavalry Regiment, on Operation ALBUQUERQUE. During this period the unit constructed two major bypasses and one heavy timber bridge reinforcement. Total of 2080 manhours and 578 equipment hours were expended.

f. Logistics. None.

g. Civic Affairs.

(1) C Company during operational support of Operation ALBUQUERQUE cleared a 300'x500' area for a new school in Vo Dat. Eight equipment hours were required for the heavy clearing that would have required many manhours from local village laborers.

## SECTION 2, Part 1, Observations (Lessons Learned).

### 1. Operations.

a. Item: Use of 3/4 yd Clamshell for feeding sand and aggregate to 16S mixer.

Discussion: Although use of one or more 16S concrete mixers at a central mix plant is a common practice and results in more efficient operation, the feeding of aggregate to the mixer is normally the governing factor in determining the rate of production unless overhead bins are available. Use of a 3/4 yard Clamshell on a 20 ton truck mounted crane to feed sand and aggregate from the stockpile direct to the hopper has been found to be an effective means of eliminating this bottleneck.

The Clamshell is first calibrated by filling it by hand with the correct amount of sand and gravel respectively and then painting a mark on the bucket to mark the correct struck level.

With the aid of a spotter, a moderately efficient crane operator is then able to fill the Clamshell bucket to the correct mark and place it in the skip of a 16S with very little spillage. Tack welding a shield on the outer edge of the hopper will reduce the spillage even more. Accuracy of batching by this method has been found to be within ten percent of the calculated quantities, which is sufficiently accurate for the normal slab on grade, nonstructural concrete required in base camp construction.



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Production from a batch plant using this method of feeding a single 16S mixer and transporting in 5 ton dump trucks averages one batch every five minutes on a sustained basis. Two mixers could be efficiently fed using one crane.

OBSERVATION: Production can be greatly increased in batch plant operation by using a calibrated Clamshell to feed the mixer if overhead bins are not available.

b. ITEM: Placing large diameter culvert in moving water as expedient bypass of damaged bridges.

DISCUSSION: Use of large diameter culvert for constructing bypasses around damaged bridges has been found to be an effective means of keeping lines of communications open while making further Viet Cong sabotage difficult. There are, however, inherent difficulties in erecting and placing culverts, 48" diameter and above, quickly in forward areas. It is recommended that the culverts be constructed either totally or in sections in a secure area. The lengths that can be prefabricated depend on the means available for moving the culvert to the job site. 25 ton lowbed trailers can carry 30 foot sections while 5 ton dump trucks and 2 1/2 ton pole trailers can each handle 15 foot sections. Extreme care should be used to assure that the sections will mate properly at the job site. All bolts should be used, particularly the rib bolts, in order to provide strength for the culvert when it is being lifted and placed.

The bed of the stream should be leveled longitudinally in order to provide proper slope. Transverse leveling so that multiple culverts are at the same elevation is desirable but not necessary if stream bed conditions do not readily allow.

After placing the culverts and before backfilling, sandbag endwalls should be placed in between the culverts on the upstream side. The endwalls will divert the moving water into the culverts and allow the fill to be placed without danger of scour. Endwalls for culverts set at different elevations or below water level should be high enough and thick enough to protect earth fill as it diverts water in higher elevation culverts. The initial fill should be placed quickly to prevent unnecessary saturation of the loose material. As soon as sufficient dry material is in place the fill should be thoroughly compacted.

The most versatile piece of equipment for this work is the 20 ton truck mounted crane with 40 foot boom and clamshell attachment. The crane can be used to prepare the stream bottom; with slings and spreader on the clamshell it can place the culvert, and it can place backfill between the culverts.

As with any engineering task, success in constructing a bypass of this type also depends on proper reconnaissance, planning and site organization.

OBSERVATION: A durable culvert bypass around bridges may be constructed in deep water using large diameter culverts if proper methods are used.

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c. ITEM: Huder Warco Model 4D Graders will not fit inside C-130 aircraft without partial disassembly.

DISCUSSION: It is commonly accepted that most engineer equipment found in Combat Engineer Battalions may be transported within C-130 aircraft. However, a serious exception is the Huber Warco Model 4D Road Grader. Although other makes require no modification the lift rams on the Huber Warco are too high and exceed the maximum allowable height. This information is not available in TB Engr 314 dated June 1962, "Planning and Procedures for Air Movement of Engineer Organizations in C-130 Aircraft."

OBSERVATION: Huber Warco Model 4D Graders are not suitable for air movement in C-130 aircraft if other makes are available.

d. ITEM: Use of culvert and earth fill for bridge replacement.

DISCUSSION: During Operation Dan Tam 81, this unit replaced twelve bridges, with culvert and earth fill. The old bridge was completely removed by blasting and the use of a dozer. The culvert was placed in the gap and the fill was placed on top by dumping the fill on the existing roadway and pushing it into the gap with a dozer.

OBSERVATION: The method of fill described did not give the necessary compaction and after a few days of heavy traffic, and additional load of fill was required. The method was adequate however for keeping the road open for both wheel and track vehicles.

e. ITEM: Use of native logs in widening existing bridges.

DISCUSSION: Six bridges were found on Operation Dan Tam 81, that were, narrow although strong enough to accommodate heavy track vehicles. This was corrected by placing a large native log on each side of the existing structure.

OBSERVATION: Although the bridge was wide enough to accommodate the vehicles, some drivers experienced difficulty in crossing the bridges, due to the rounded edges of the logs, and the small gap between the edges of the structure and the top of the log. This was corrected by placing a load of fill on the bridge to fill the gap.

f. ITEM: Conversion of air driven hand saw to bench mounted table saw.

DISCUSSION: It was found that the production of necessary louver blocks was very time consuming when utilizing the electrical "skill saw" (a rate of 260 blocks/hour being the average). A method was devised to mount the air driven, heavy duty saw, which is a component of the J210 Air Compressor tool set, on a bench with templates to guide the cuts. Upon putting this system into effect a production rate was increased to 510 blocks per hour. The same rig was found extremely useful for ripping 2x4 and 1x4, especially in long strips, as the heavy duty saw could operate for longer periods of time with less down time. Oil level should to maximum when the saw is used inverted and checked frequently.



OBSERVATION: That the mounting of the air driven saw in a bench rig will greatly reduce the time necessary for repetitive cuts (louver blocks, etc) and that such use will result in less equipment failure.

g. ITEM: Expedient rock anchor system.

DISCUSSION: Expansion anchors for use in rock formations were unavailable through local supply channels for the Signal Relay Tower on Hill 837. The standard 1 inch diameter eye bolt anchors were cut to two foot lengths and 1 1/2 inch diameter holes were drilled in line with guy cables and about two feet into the rock. Seven 2 foot lengths of 3/8 inch diameter reinforcing rods were driven around the eye bolt and the remaining voids filled with a cement slurry. A test using two 5 ton hydraulic jacks and a 1" diameter rod proved it an adequate holdfast.

OBSERVATION: An expedient rock holdfast can be made using an eye bolt anchor with reinforcing rods driven around it.

h. ITEM: Sling Loading of CH-47 aircraft.

DISCUSSION: A 16S concrete mixer was hook loaded from a single suspension point by a 12' length of tow chain and the standard nylon doughnut rolls during an airlift operation supporting cantonment construction on Hill 837. Sling loading of the CH-47 was necessary in placing the mixer at the otherwise inaccessible worksite. During the flight vertical bounce was induced in the payload and was scrubbed by the pilot as a serious threat to the aircraft's safety.

During similar airlift operations to Hill 837 a 4000 pound bundle of corrugated roofing tin was sling loaded to a CH-47 aircraft with bridle line spreader and single point hook suspension. During flight the flat bundle began to act as an air foil inducing independent flight and again the payload was jettisoned as a serious threat to the aircraft's safety.

OBSERVATION: More information is needed on equipment and material suitable for loading of CH-47 aircraft and the proper rigging of such payloads.

i. ITEM: Driving of "U" shaped steel pickets.

DISCUSSION: During installation of a considerable quantity of protective concertina wire, this unit found a very fast, efficient way to install "U" shaped pickets using the bucket of a front end loader. Pickets are spotted along the line of wire. As the front loader moves in reverse along the intended line of wire, one man paces the interval while the other man holds the picket. By lowering the bucket the operator then presses the picket into the ground to the desired depth.

OBSERVATION: Several hundred "U" shaped steel pickets can be placed per hour utilizing a front end loader and thus greatly reduce the engineer effort in constructing protective wire.

j. ITEM: Use of expended 175 mm and 8" powder canisters for expedient tent floor piers.

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DISCUSSION: Prior to the erection of the usual wooden tent floors, this unit decided to take advantage of the abundant supply of 175mm and 8" expended powder canisters available. By setting these canisters partially into the ground with closed end down, it is possible to create an expedient system of piers. The normally constructed tent floor is then built above the mud and uneven terrain.

OBSERVATION: 14 man crew can erect a system of expedient piers from 175mm and 8" expended powder canisters for a GP medium tent in approximately 2 hours.

k. ITEM: Asphalt distributor loading rig (dedrumping rig).

DISCUSSION: The enormous effort required to empty the many drums of penepime and asphaltic materials used in horizontal construction into a distributor led to the construction of a dedrumping rig by this unit. A raised platform of telephone poles was constructed so that 10 drums could be laid in the horizontal position. A large half cylinder trough made from a bomb casing was constructed below the orifice of the drums and a pipe with valve welded to the under side. A boom derrick located along side easily places the drums into position.

OBSERVATION: The effort required in loading an asphalt distributor can be considerably reduced with a boom derrick and raised loading platform.

l. ITEM: Use of Asphaltic materials.

DISCUSSION: Dust palliatives for non-traffic areas are best provided by an RC-1,2 which will cure rapidly with little absorption, however traffic areas such as roadways require repeated applications of road oils, (MC-3,3 or SC-0,3), where high absorption is required to prevent erosion of the wearing and sealing surface. An application rate of one-half gallon per square yard has proven most successful.

A mixed in place surface is planned for a forward liaison airfield now under construction. A laterite base of eighteen (18) inches is being placed on well compacted native clay soil. The laterite soil has a minimum particle size of 3/4 inches with approximately 20 percent passing the number 200 sieve. It is planned to scarify the top two (2) inches of the soil, add approximately 6 percent, by weight of cutback asphalt, mix, spread and then compact with thirteen wheel roller. Although MC is recommended cutback for this application, RC-3 is immediately available and will be utilized.

OBSERVATION: Although Penepime has been used as a dust palliative on traffic areas, it has provided a temporary solution at best removing the immediate hazards of vehicle accidents. Repeated treatment of both penepime and diesel are necessary to keep hazardous conditions to a minimum.

2. Intelligence.

a. ITEM: Existing reinforced concrete T-Beam bridges encountered in LOW KHANH Province.

EBC-CO

13 February 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65)  
For Quarterly Report Ending 31 January 1967

DISCUSSION: During ground reconnaissance activities by this unit in operational support of the 11th Armored Cavalry Regiment, many reinforced concrete T-Beam bridges have been encountered. It is apparent from the cross section of these bridges that they were designed for heavy loads with a narrow wheel base. US vehicles especially M-48 tanks with a much wider wheel base are forced to distribute their load on the thin outer edges of the slab and in some instances on a curb. Special attention should be given during reconnaissance of such bridges and reinforcement recommended to prevent these weak edges or curbs from breaking off and further reducing the effective width.

OBSERVATION: Although many reinforced concrete T-Beam bridges have adequate cross section to carry class 60 and class 65 loads many do not have adequate width to properly accept the load distribution of armored vehicles.

b. ITEMS: Marking of airfields.

DISCUSSION: This unit has had the assigned mission of marking several airfields after reconnaissance or upgrading operations. Twelve foot long arrows are fabricated from PSP panels and 18" long "U" shaped pickets are welded to the underside. If airlift operations are necessary, these arrows can be sectionalized so that 2 12 foot arrows weighing 300 lbs and a 3 man placement crew can be safely carried in a UH-1B helicopter. Arrows are then driven to within six inches of the ground at the touchdown points at each end of the runway.

OBSERVATION: Arrows can be fabricated from PSP to provide distinctive and readily transportable airfield markers.

3. Logistics and Maintenance.

a. ITEM: Transport of rock crusher conveyor system.

DISCUSSION: This unit received a 75 ton per hour "Eagle" primary and secondary crushing unit. Three conveyors came with the rig. The conveyors were transported to our location in a piggy-back fashion which caused severe bending and twisting of the conveyor cross members.

OBSERVATION: That conveyors for rock crushing units be shipped separately and never loaded piggy-back for any future transportation.

b. ITEM: Numerous flat tires during a sustained engineer effort can affect required maintenance services.

DISCUSSION: The number of flat tires and blow-outs can be extremely high while attempting a sustained engineer effort. A line company motor pool may find itself doing nothing but changing tires and patching tubes, leaving little time for required maintenance services. One solution that this unit has employed is the establishment of a central tire fix it shop in the battalion maintenance section using Vietnamese civilian workers, under maintenance personnel supervision, to do the work. Line companies direct exchange their flats and blow-outs for new or repaired tires.

OBSERVATION: A central tire repair shop using Vietnamese civilian workers can increase the effort available for required maintenance services.

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 EFC-3

15 February 67

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65)  
 for Quarterly Period Ending 31 January 1967

SECTION 2, Part II, Recommendations.

1. Personnel: None.

2. Operations:

a. From the first days of operation in Vietnam, it became apparent that the augmentation provided by paragraph 11 of TC&E 5-35E (corrected Copy), dated 11 February 1965, was essential to the accomplishment of the cantonment construction mission assigned this unit. The augmentation provided in this combat construction section includes such essential personnel as Engineering Officer, Utilities Maintenance Technician, 5 Carpenters, 5 Electricians, 4 Plumbers, 1 Mason and one Heating and Ventilating Specialist. These specialized personnel and their respective tools and equipment are vital to a combat engineer unit assigned the primary mission of cantonment construction. It is recommended by this headquarters that such augmentation be effected as soon as possible to such units.

3. Training and Organization: None.

4. Intelligence:

a. It is recommended that the S-2 Section be augmented with three Armored Personnel Carriers in lieu of the 3 3/4 ton trucks presently authorized. With their present mission of deliberate road and airfield reconnaissance in operational support of the 11th Armored Cavalry Regiment, it is imperative that they have the same mobility and firepower of the security element.

✓ 5. Logistics: None.

6. Other: None

*Richard F. Gurney*  
 RICHARD F. GURNEY  
 Maj, CE  
 Acting Commander

DISTRIBUTION:

- 3 - (Priority channels) - ACSPOR DA
- (2 w/1st Ind) - ACSPOR DA (Airmail)
- 2 - COMUSARPAC, ATTN: GPOF-01 (Airmail)
- 3 - 1st AFV, ATTN: AVG - 1st AFV (Courier)
- 15 - CG, 79th Engr Gp
- 15 - S-1, 27th Engr Bn (C&A)
- 1 - File

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H  
BGE-00 (13 Feb 67) 1st Ind  
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) For  
Quarterly Period Ending 31 January 1967

DA, HEADQUARTERS 79TH ENGINEER GROUP, APO 96491, 23 February 1967

TO: Commanding General, US Army Engineer Command Vietnam (Prov),  
APO 96491

1. The operational report of the 27th Engineer Battalion has been reviewed and is considered adequate. Inclosure 1, an organization chart of the 27th Engineer Battalion, is added to the report.

2. The recommendations of the commander in Section 2, Part II have been reviewed and the following comments are submitted:

a. This headquarters concurs with the recommendation concerning the augmentation of combat battalions with the section provided by paragraph 11, TOE 5-35E. This recommendation has been the subject of previously submitted correspondence from this headquarters.

b. This headquarters is not convinced that the requirement for three armored personnel carriers in the S-2 section is fully justified and not in the "nice to have" category. Simple replacement of the 3/4-ton vehicles with personnel carriers is not a complete solution. The unit would need an augmentation of tracked vehicle drivers and an additional maintenance capability. A letter has been sent to the 27th Engineer Battalion informing them that should this requirement be essential to the fulfillment of their mission, proper documentation, with full justification, should be submitted.

1 Incl  
Organization Chart

  
WALTER C. GELINI  
Colonel, CE  
Commanding

Copies furnished:  
ACSFOR DA (Duplicate)  
27th Engr Bn

AVCC-MHD (13 Feb 67)

2d Ind

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for Quarterly  
Period Ending 31 January 1967

HEADQUARTERS, UNITED STATES ARMY ENGINEER COMMAND  
VIETNAM (PROV), APO 96491 22 MAR 1967

TO: Commanding General, United States Army, Vietnam, ATTN: AVHGC-DH,  
APO 96307

1. The subject report, submitted by the 27th Engineer Battalion (Cbt), has been reviewed by this headquarters and is considered adequate.

2. The recommendations and comments of the indorsing and submitting commanders have been reviewed and this headquarters concurs, subject to the following added comments:

a. Section 1, paragraph 1c(2). All USAECV (P) and USARV Regulations are published on an "A" distribution. Group headquarters will be contacted concerning their distribution system.

b. Section 1, paragraph 2d(7). Photographic equipment shortages are presently under study at 1st Logistical Command. This headquarters is monitoring the program. Some equipment has been recently received.

c. Section 2, Part I, paragraph 1h, page 12. Units operating within the II and III CTZ can gain assistance pertinent to rigging of helicopter sling loads by contacting the 56th Transportation Company (ADS), located at Tan Son Nhut APO 96307. This information has been given to Headquarters, 27th Engineer Battalion (Cbt).

d. Section 2, Part II, paragraph 2a and paragraph 2a 1st Indorsement. Any changes to the present force structure can only come about if assets are traded off. In the near future construction battalions are expected to assume the bulk of the base development work now being done by combat engineer battalions. For this reason it would not be in the best interest of the command to request such augmentation.

FOR THE COMMANDER:



RICHARD J. DUCOTE  
Colonel, CE  
Chief of Staff

USARV, ATTN: AVHGC-DH



AVHQC-DH (13 Feb 67) 3d Ind  
SUBJECT: Operational Report-Lessons Learned for the Period Ending  
31 January 1967 (RCS CSFOR-65)

HEADQUARTERS, UNITED STATES ARMY VIETNAM, APO San Francisco 96307 19 APR 1967

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOR-OT  
APO 96558

1. This headquarters has reviewed the Operational Report-Lessons Learned for the period ending 31 January 1967 from Headquarters, 27th Engineer Battalion as indorsed.

2. Pertinent comments follow:

a. Reference Paragraph 1f(1), Page 5, concerning surges in supply of construction materials: Concur that such a situation does exist. In many cases, close liaison must be maintained with supply points. The unit's attempted solution is appropriate, and when adhered to, will even the flow of construction materials. However, as long as the present rate of construction in RVN continues, supply problems will exist in this area. Availability of funds and transportation, and priority of issue, all contribute toward unstable supply flow. Continued advance planning by all levels of command is the only valid control measure that can be utilized until the rate of material consumption decreases.

b. Reference Paragraph 1f(6), Page 6, concerning unit's alternate source of  $\frac{1}{2}$ -inch wire rope: Nonconcur with this procedure unless the equipment is being evacuated.

c. Reference Paragraph 1f(8), Page 7, concerning Red Ball Express deliveries: The time frame cited by the unit is considered acceptable for the items requested by the unit and its location in relation to the supply pipeline. Concur with the observation that the system should not be overloaded.

d. Reference Paragraph 2d(7), Page 8; and Paragraph 2b, 2d Indorsement, concerning a shortage of photographic equipment: This shortage does exist in-country. Actions being taken to alleviate this shortage include those as stated in the 2d Indorsement. Additionally, as assets are arriving in RVN, unit shortages are being significantly reduced. AMC-CAO continually advises USAFECOM of types of equipment which are short. Concurrently, this headquarters collects data on specific outstanding requisitions.



AVHGC-DH

3d Ind

19 APR 1967

SUBJECT: Operational Report-Lessons Learned for the Period Ending  
31 January 1967 (RCS CSFOR-65)

e. Reference Paragraph 2, Page 15; Paragraph 2a, 1st Indorsement; and Paragraph 2d, 2d Indorsement, concerning augmentation to TOE: Concur with comments of US Army Engineer Command, Vietnam, in 2d Indorsement.

f. Reference Paragraph 4, Page 15; and Paragraph 2b, 1st Indorsement, concerning vehicles for S2 section: Concur with action taken by 79th Engineer Group, as reported in 1st Indorsement.

FOR THE COMMANDER:



STANLEY E. SCHULTZ  
Major, AGC  
Asst Adjutant General

1 Incl  
no

23  
GPOP-OT(13 Feb 67)

4th Ind


SUBJECT: Operational Report-Lessons Learned for the Period Ending  
31 January 1967 (RCS CSFOR-65), HQ 27th Engr Bn (Cbt)

HQ, US ARMY, PACIFIC, APO San Francisco 96558 11 MAY 1967

TO: Assistant Chief of Staff for Force Development, Department of the  
Army, Washington, D. C. 20310

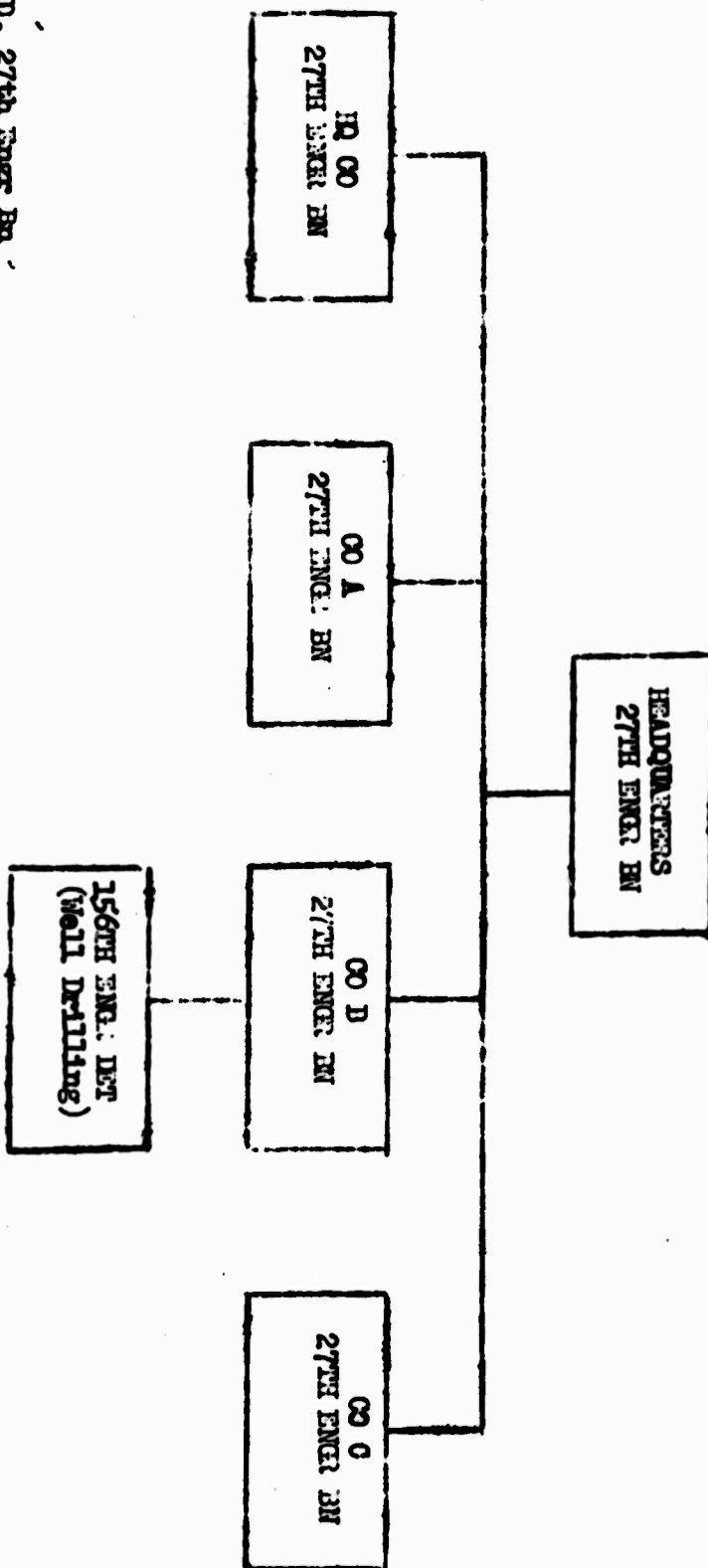
This headquarters concurs in the basic report as indorsed.

FOR THE COMMANDER IN CHIEF:

  
G. R. KOBANE  
CPT, AGO  
Asst AG

1 Incl  
nc

NOTE: Co D, 27th Engr Bn  
attached to 3rd Acs,  
4th Inf Div



ORGANIZATION CHART  
27TH ENGINEER BATTALION (CONBAT) (AMSC)  
AS OF: 31 January 1967

*Inclsure #*

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Incl 1 to Operational Report - Lessons Learned

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